

APL★PLUS®News

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Mouse Support and Lotus Interface Top List of New Features in APL★PLUS II Version 3

Latest Release Hits New Highs in Ease of Use

APL★PLUS II, Version 3, STSC's latest release for 80386 computers, offers a host of new features to boost productivity and programming efficiency, without sacrificing any of the speed, flexibility, or capacity that APL★PLUS II stalwarts have come to rely on.

Mouse Support

Topping the list of Version 3's new user-friendly enhancements is mouse support for the IBM® Personal System/2™ Mouse and the Microsoft™ Mouse, which make editing in the session manager quick and convenient. You now have point-and-click access for selecting from menus; moving around the edit ring; scrolling through sessions; and tagging, copying, moving, or deleting blocks of text or numbers, within a session or among different sessions. Mouse support can be incorporated into your applications as well.

New Interfaces

Version 3 also expands the powerful data manipulation capabilities of APL★PLUS II.

- **Lotus Interface**
Data can be easily imported from a Lotus® 1-2-3® worksheet for complex calculations using APL★PLUS II, then exported back to Lotus.
- **IRMA® Interface**
Through your IRMA communications interface to the mainframe environment, you can transfer APL workspaces and files to and from an IBM mainframe.
- **□ N A FORTRAN**
This new interface includes support for programs compiled in real mode with Microsoft's™ FORTRAN, Version 5.0, and programs compiled in protected mode with Microway's NDP FORTRAN-386,™ Version 2.0.

Productivity Enhancements

- **User Command Processor**
A user command processor (integrated into the interpreter) lets you use utilities as you use system commands. You can define and store a set of commands that are always available, regardless of the workspace you are using. More than 25 predefined utility commands are included in Version 3, so you

can easily manipulate objects in the active workspace or in command files.

- **New Utility Workspaces**
A variety of utility workspaces are included to help you document the contents of workspaces and files; manage reports and output files; and compare and maintain functions, files, and workspaces.

Continued on page 2

CONTENTS

APL★PLUS II Version 3	1-2
APL Highlighted in <i>Best's Review</i>	2
APL90	3
STSC at APL90	3
Treasure Chest	4-5
APL Training	6
STSC Wins Documentation Award	6
STSC Award for Excellence in APL Applications	7
APL★PLUS for RS/6000	7
Answers from the Experts	7
Educational Software Grant Program	8

Additional DOS Memory and Faster Screen Interactions

Version 3 provides access to additional DOS memory. The session manager and the interpreter have been merged in extended memory. Both run in protected mode, freeing up more DOS memory for use and allowing faster operation of screen-related system functions. You can now load more terminate-and-stay-resident (TSR) programs, such as networking software, without interfering with APL★PLUS II. The new 32-bit session manager also allows larger amounts of memory to be used for editing.

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Enhanced Printer and Video Display Support

Version 3 includes PostScript® printer support so you can print APL characters and customize your APL output with a variety of PostScript options. Additional support for non-PostScript printers is also provided.

This new release also makes it easier to take advantage of your color monitor. You can use session startup parameters to select different colors for the APL session and status line, edit session and status line, partially and fully tagged regions, and the wrapped-line marker. The system also supports the use of light background colors instead of the blinking attribute. Color can be used in your applications as well.

With Version 3, you can work with video modes that display more than the standard 80-column, 25-row screen. Display resolutions of 80×43, 132×43, and others are possible, depending on the capabilities of your display adapter. A single program to load and unload APL fonts on EGA and VGA displays is provided.

Call for More Information

Version 3 is scheduled for release in the United States and Canada in July. International release is scheduled for mid-August. For additional information on Version 3, call STSC at 800-592-0050. In Maryland, call 301-984-5123. Outside the United States, call your local dealer or 301-984-5412 for the name of the dealer nearest you.

Actuarial Use of APL Highlighted in *BEST's Review*

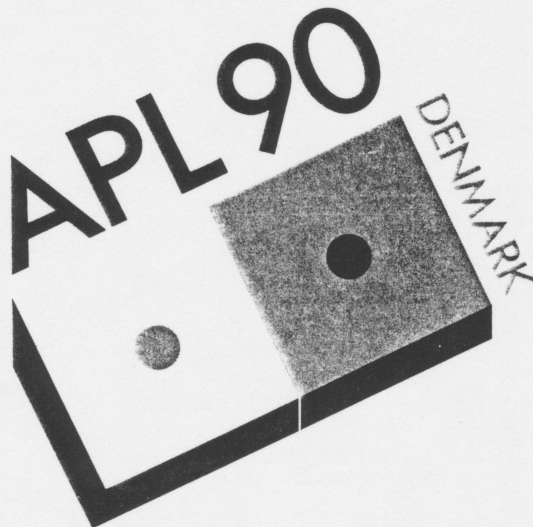
An excellent article by an APL★PLUS user appeared in the May issue of *Best's Review* (property/casualty edition), a key insurance industry publication. Richard Vaughan, Vice-President of Seabury & Smith (previously known as Marsh & McLennan Group Associates) focuses on the value of APL for the actuary, but he echoes the sentiments of all avid APLers. "[APL] excels not only for writing quick ad hoc programs but also for developing and running complex and permanent applications," he writes. "APL's syntax, while indeed nontraditional, is so simple that it can be mastered in about an hour," he adds. In describing his firm's loss-reserving and classification ratemaking systems, Vaughan also notes the power of APL, "We are able to make more tests, and more sophisticated tests, than we possibly could have considered before developing the system[s]."

To obtain a reprint of the *Best's Review* article, call STSC at 800-592-0050. In Maryland, call 301-984-5123. Outside the United States, call your local dealer or 301-984-5412.

Help Publicize APL

STSC is always looking for opportunities to expand awareness of APL applications. If you have an idea for an article, give us a call. We may be able to put you in touch with an interested trade publication. Press coverage is an ideal way to expand awareness and use of APL and can be a valuable source of publicity for you and your company. For additional information, contact Ed Beemer, Corporate Communications, at 301-984-5385.

APL90 To Be Held in Copenhagen



FOR THE FUTURE

APL90, the 22nd annual international conference on APL will be held August 13-17, 1990, in Copenhagen, Denmark. The theme of this year's conference is "For the Future," and many of the presentations and activities will focus on potential directions for new APL developments.

The conference promises to be an excellent opportunity for APL users to catch up on the latest advances in software and hardware and share ideas and information with other users. Internationally recognized APL experts Trenchard More, former research fellow with IBM, and Alan Huang, Chief Scientist for AT&T, Bell Laboratories, will speak, along with other prominent APL proponents. Forty-seven papers will be presented at the conference, covering topics ranging from APL and supercomputing to the family of Soviet APL systems. A series of poster sessions is also scheduled. These informal presentations usually serve as a forum for a variety of APL-related topics. APL90 will also include a software exchange, where attendees can share code with other members of the APL community.

The Conference Exhibition will feature the latest advances from APL vendors and related software and hardware products. Vendors will also offer technical presentations on new and enhanced products.

Several social events are planned for conference attendees, including a trip to the Danish Science Museum and a banquet on the final night of the conference.

For additional information on APL90, contact

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STSC at APL90

If you plan to attend APL90, be sure to stop by the STSC booth at the Conference Exhibition. We'll be demonstrating the latest APL★PLUS II release, Version 3, which includes a $\square$ NA FORTRAN interface, a user command processor, a LOTUS interface, and mouse support. APL★PLUS PC Version 9.1 will also be on display.

Members of STSC's international dealer community will join us at the exhibition. Uniware, France, and Cybex, Sweden, will showcase APL★PLUS enhancements and application packages.

STSC will also be well represented during the APL90 conference program; six STSC staff members will be presenting papers.

- Steven Promisel, Manager, Applications and Systems Consulting, and James Merrill, Senior Applications Consultant, will describe how a jewelry manufacturing business uses APL-based computer systems to analyze pricing issues and handle the manufacturing process.
- Ralph Fox, PC APL Development Manager, will demonstrate ways to use color display attributes to make the APL★PLUS PC and APL★PLUS II Systems more productive.
- William Rutiser, Computer Scientist, will discuss an experimental interface from an APL implementation to the X Window System and an APL object-oriented programming style for creating graphical user interfaces.

Continued on page 6

Treasure Chest

by Ralph L. Fox

Colorize Your Functions

Some programmers have suggested that APL functions might be more easily organized and maintained if they could be displayed with various colors to indicate their different aspects. This article shows how to implement a simple scheme to provide separate colors for comments, character constants, and numeric constants. You can extend this scheme to support additional colors for labels, global variables, specific code strings, and so on.

Key to analyzing an APL function is the use of partition functions to simultaneously operate on disjoint parts (usually the individual lines) of its visual representation ($\square VR$). A partition vector (P , below) is a boolean vector starting with 1 that has subsequent 1s marking the beginnings of separate parts of another vector (B , below). Many partition functions exist that apply primitive functions and operators to each individual part of a subject vector. In these examples, $\vee\backslash$ and $\neq\backslash$ are applied to each part of B . (The spacing of all vectors has been adjusted for clarity.)

```
P← 1 0 0 0 0   1 0 0   1   1 0 0 0   1 0           (Partition vector)
B← 0 1 0 1 0   0 1 0   1   1 1 0 1   0 1           (Subject vector)
P pORSCAN B
  0 1 1 1 1   0 1 1   1   1 1 1 1   0 1
P pNESCAN B
  0 1 1 0 0   0 1 1   1   1 0 0 1   0 1           (Parity of the number of 1s)
```

```
▽ R←P pORSCAN B;A
[1] A∇ bv2←partvec pORSCAN bv1 -- Partitioned ∨\ of a bitvector
[2] A←B∨P ∘ R←A/B ∘ R←R≠~1↓0,R ∘ R←≠\A\R
▽
▽ R←P pNESCAN B
[1] A∇ bv2←partvec pNESCAN bv1 -- Partitioned ≠\ of a bitvector
[2] B←(ρP)ρB ∘ R←P/≠~1↓0,B ∘ R←R≠~1↓0,R ∘ R←≠\B≠P\R
▽
```

The challenge in displaying a function in color is that starting with a vector representation, we must produce an appropriate $\square WPUT$ argument: a rank-3 character array with the function listing in the first column and corresponding screen attributes in the second. The CVR function produces such a screen panel, after using the partition functions above to sort out which parts of a function are comments and which are constants outside of comments. $MATtoMAT3$ then handles the formation of the rank-3 panel from a lamination of the vector representation and an attribute vector.

```
▽ R←C CVR F;A;CC;CT;I;N;P;Q;V;∅IO
[1] A∇ panel←{colors} CVR fnname -- Colorized visual representation
[2] A∇ colors -- optional screen attributes for:
[3] A∇ comments, char constants, num constants, rest of code
[4] A∇ Required fns: MATtoMAT3, pNESCAN, pORSCAN
[5]
[6] ∅IO←1 ∘ R← 0 0 2 ρ' ' ∘ →(ρV←∅VR,F)↓0 A Exit if not unlocked fn
[7] ⚡(0=∅NC 'C')/'C←⚡' ∘ C←,C ∘ C←4↑C,(ρC)↓ 11 110 13 15 A Color defaults
[8] P←V←∅TCNL ∘ P[1]←1 A Partition vector for each line
[9] A Get first approx to char constants (valid up to first real A):
[10] CC←P pNESCAN Q←V←''''
[11] CT←P pORSCAN CC←V←'A' A Comment text (from first real A rightward)
[12] CC←CT<Q<CC A Remove comment parts & leading quotes for char constants
[13] N←(CC∨CT)<V←'1234567890.' A Numbers not in comments, char constants
[14] A Flaw here is that we also color the . operator!
[15] A←'ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyzΔ_'
[16] Q←N>~1↓0,N A Indicate the beginning of each numeric string
[17] I←Q/ρQ A Their initial indices
[18] N[I]←~V[I-1]∈A A Make sure the digits are not part of an identifier
[19] Q[1]←1 A Make partition vector for each string of digits
```



```

[20] N←~Q pORSCAN ~N A Run pANDSCAN equivalent to get true numbers
[21] N←N^P pORSCAN Vε']' A Don't include [nnn] function line numbers
[22] R←4-N+(2×CC)+3×CT A Vector of appropriate color indices
[23] R←MATtoMAT3 (□TCNL,V),[1.5]□AV[1+C[4,R]] A Form screen panel

```

```

▽
▽ R←A MATtoMAT3 M;B;C;D;S;□IO;□SEG
[1] AV panel←(fillattr) MATtoMAT3 mat -- Make screen data from 2-col matrix
[2] AV in the form: segstring,[.5+□IO] charattributes
[3] AV "SStoMAT" is done on the first column, while optional <fillattr>
[4] AV is used to pad the second column (default: regular scrn attribute)
[5]
[6] □IO←0 ◇ □SEG←0 ◇ ±(0=□NC 'A')/'A'←□PEEK 161' ◇ A←□AV[A] A Fill attrib
[7] →(2=ppM)ρL1 ◇ S←pM←,M ◇ M←(S,2)ρM,(0≠S)↓' ',A A Convert vector arg
[8] L1:S←pB←M[;0] ◇ D←Bε1ρB ◇ C←D/1S ◇ D←~D ◇ M←D/M A Remove delimiter
[9] D←(1↓C,S)-C ◇ C←D.→1↓1/D
[10] S←pC ◇ C←,C A Expansion vector
[11] M←C/M ◇ C←~C A Insert spaces to pad rows to fixed length
[12] C←C/1ρC A Expansion slot indices
[13] M[C;1]←A A Insert fill attribute
[14] R←(S,2)ρM A Reshape to rank 3

```

The final hurdle is how to display a colorized function panel that is larger than the physical screen. The next function will display any screen data, allowing you to scroll a large panel with the ←, ↑, ↓, →, Home, and End cursor keys. Any other keystroke exits and restores the original screen.

```

▽ RC SHOWPANEL PN;AT;BV;DW;JP;KY;RK;SC;SD;SW;SZ;X;□IO;□SEG
[1] AV (rowcoloffset) SHOWPANEL panel -- Scrollable screen data display
[2]
[3] □IO←0 ◇ ±(0=□NC 'RC')/'RC'←0 0' A Default starting row & column
[4] SW← 0 0 ,□CRT[4 5] A Entire screen window
[5] SC←SW □WGET 3 A Save original screen
[6] □SEG←0 ◇ AT←□PEEK 170 A Status line attribute
[7] RK←ppPN ◇ SZ←2↑ρPN A Rank, panel size
[8] JP←1(SZ1SW[2 3])+3 A Scroll jumps
[9]
[10] L1:SD←(RK↑RC)↓PN A Potentially viewable screen data
[11] DW←SW1 0 0 ,2↑ρSD A Set the data window required
[12] SW □WPUT □AV[176] ◇ SW □WPUT AT A Block out existing screen
[13] DW □WPUT (DW[2 3],2↓ρSD)↑SD A View (part of) screen data
[14]
[15] L2:KY←1↑ 0 11 -1 0 -1 2 □ARBIN 0 A Wait for keystroke
[16] →(1εBV←KY= 393 391 420 389 281 394 388)↓L6 A Scrolling keys
[17] →(4ρBV)/L3 ◇ X←2↑BV[6]×0[SZ[0]-SW[2] ◇ →L4 A Handle Home≡Alt ←, End
[18] L3: A Handle ↑ ← ↓ → subject to minimum view of 4 rows, 5 cols
[19] X←0↑(SZ- 4 5)1RC+(JP×BV[2 3])-JP×2↑BV
[20] L4:→(RC≡X)↓L5 ◇ □←□TCBEL ◇ →L2 A Chirp if no change
[21] L5:RC←X ◇ →L1 A Redo view
[22]
[23] L6:SW □WPUT SC A Restore original screen

```

Thus to colorize any function, just run `SHOWPANEL CVR 'FNNAME'`. To supply non-default colors, simply insert a left argument for CVR.

*Editor's Note: At APL90, Ralph Fox will demonstrate how color display attributes can be used to make the APL *PLUS and APL *PLUS II Systems more productive.*

STSC Sponsors Award for Excellence in APL Applications

STSC is pleased to announce the creation of a new award, to be given annually to a young professional who has demonstrated technical excellence in the practical application of APL.

The individual selected will receive a \$1,000 cash award and a plaque honoring his or her achievement.

To be eligible, applicants must be 30 years of age or younger and must complete an application form describing their APL application. The application may be written in any commercially available implementation of APL and must be completed and have been in use (commercially or privately) for a minimum of three months.

Completed application forms must be received by STSC no later than July 31, 1990. The award will be announced at the APL90 Conference in Copenhagen, Denmark, in August. For more information or to receive an application, contact STSC at 800-592-0050; in Maryland, 301-984-5123. Outside the United States, contact your local dealer or call 301-984-5412.

APL★PLUS UNIX System For IBM RS/6000

STSC is currently evaluating the technical feasibility and market demand for the APL★PLUS UNIX® System on IBM's RISC System/6000,™ the newest member of the IBM AIX™ family.

If you are interested in APL★PLUS UNIX for the RS/6000, contact your STSC sales representative at 800-592-0050 (in Maryland, 301-984-5123; outside the United States, contact your local dealer or call 301-984-5412).

Answers from the Experts

For each issue of *APL ★PLUS News*, members of STSC's Client Satisfaction Group answer questions frequently asked by APL★PLUS users.

Q. *When I try to start APL★PLUS II, I get the following message:*
CONFIG file not found

My CONFIG.APL file is in the APL subdirectory with all of my other APL files. What is causing this error message?

A. The error message may be referring to a different configuration file. The original CONFIG.APL file provided with your APL★PLUS package contains statements to load other configuration files called PCPFKEYS.APL and STDKEYS.APL. These files are usually not loaded at startup because the statements are marked as comments. If the comment marks have been removed, APL might be trying to load these files. For example, if your CONFIG.APL file contains statements such as

```
config=pcpfkeys.apl
config=stdkeys.apl
```

the configuration files must be contained in the current directory when APL★PLUS II is started. If your configuration files are in another directory, you should specify the full path to the files with statements such as

```
config=c:\aplii\pcpfkeys.apl
config=c:\aplii\stdkeys.apl
```

Q. *I have a new IBM Personal System/2 Model 70. Soon after I start APL, all of the characters on the keyboard change. I can't even reboot because I can't find Ctrl-Alt-Del. What's happening?*

A. IBM has recently introduced a new keyboard controller in the Model 70. An interaction within this controller causes this problem when the keyboard lights are switched off or on while in APL. The quickest solution is to enter '□□POKE 879 '(disable keyboard lights) from APL. More permanent solutions to the problem that will allow use of the keyboard lights are included in the latest releases of APL★PLUS Systems.

Q. *I have an APL★PLUS II function that places commands in the keyboard buffer using □INBUF. But if I execute □CMD before the function finishes executing, the commands are lost. How can I use □CMD and preserve the contents of the keyboard buffer?*

A. Use a cover function for □CMD that first saves the contents of the keyboard buffer, executes □CMD, then restores the contents of the buffer. Use a cover function such as the following:

```
▽ R←CMD R;K;BS
[1] A
[2] A COVER FUNCTION FOR □CMD
[3] A RE-BUFFERS ANY PENDING KEYSTROKES AFTER RUNNING □CMD.
[4] A
[5] A MAXIMUM KEYBOARD BUFFER SIZE. CHANGE THIS AS NEEDED.
[6] BS←512
[7] A READ ANY KEYS IN THE BUFFER
[8] K←~1↓(0 11 ~1 0 0,BS □ARBIN ''
[9] A CALL □CMD
[10] R←□CMD R
[11] A RESTORE THE KEYBOARD BUFFER
[12] □INBUF K
▽
```